

REMARKS

This is in response to the October 27, 2004 Office Action.

In the Action, claims 10-28 are rejected, and claim 29 is withdrawn from consideration as being directed to a non-elected invention. In response, claim 29 is cancelled, and claim 18 is amended to correct minor clerical errors. Thus, the pending claims in the application are claims 10-28, with claim 10 being the sole independent claim. In view of the following comments, reconsideration and allowance are requested.

Claims 10-28 are rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,579,162 to Chesley et al. in view of U.S. Patent No. 5,281,371 to Tamura et al. Chesley et al. is cited for disclosing a process for making fasteners by introducing a flowable resin material into a mold. Chesley et al. is also cited for disclosing radiation polymerizable resins for forming the fasteners. Tamura et al. is cited for allegedly disclosing UV-curable prepolymers. The rejection is based on the position that it would be obvious to use the prepolymers of Tamura et al. in the process of Chesley et al.

Claim 1 is directed to a process for producing cling fasteners by supplying a radiation-cross linkable prepolymer formulation to a forming station and forming a large number of the interlocking members and subjecting the prepolymer formulation to radiation to cure the formulation. The claimed combination of the claim features is not disclosed or suggested in the art of record.

As noted in the Action, Chesley et al. does not disclose prepolymers or a prepolymer formulation. Furthermore, Chesley et al. does not disclose radiation cross linkable prepolymers as claimed. The passage referred to in the Action describes thermosetting resins that are cured by

heating. This passage also refers to thermosetting resins that can be cured by radiation. Chesley et al. does not disclose any radiation-curable or radiation polymerizable prepolymer compositions. The resins that are specifically disclosed in Chesley et al. are expressly defined as thermosetting resins and thermoplastic resins.

Chesley et al. refers to the thermosetting resins as being applied to the mold as a liquid which is then polymerized in the mold. The prepolymer formulation of the claimed invention is a flowable material but is not necessarily liquid. In the embodiment described in the specification and shown in the Figures, the prepolymer formulation is applied to the backing sheet and spread across the backing sheet by a doctor blade or knife. The coated backing sheet is then directed to the molding drum so that the prepolymer formulation is pressed into the cavities of the mold where the prepolymer formulation is then cured by radiation. Thus, the radiation-cross linkable prepolymer formulation of the invention is not a liquid that is capable of flowing into the cavities of the mold surface in the same manner of the cited art as suggested in the Action.

Chesley et al. is primarily directed to a method of using a thermoplastic material that is applied to a mold surface to fill the cavities of the mold. The thermoplastic material is then cooled to solidify and form the hooking stems. The stems of the fasteners are cooled from the tip of the stem in the mold surface outwardly to the base of the fastener. In contrast, the fasteners of the invention are formed by curing the prepolymer composition by subjecting the prepolymer composition to radiation. The radiation is directed from the outer surface of the mold. Thus, curing of the prepolymer composition starts at the base and proceeds in the direction of the stems to the tip of the stems within the cavity of the mold. Therefore, the most intensive UV radiation,

and therefore, the most complete polymerization is at the base of the fastener part and not at the stems. The tips of the stems are subjected to the least amount of the curing radiation. The stems and tips of the fasteners which have a lower degree of curing are additionally stressed as they are removed from the mold cavities.

Tamura et al. does not disclose radiation-cross linkable prepolymers suitable for forming interlocking cling fastener parts. Tamura et al. is cited in the Office Action for disclosing photopolymerizable acrylates. However, Tamura et al. does not disclose prepolymers or radiation-cross linkable prepolymers. The resin composition, the method of forming the final product, and the final product of Tamura et al. are unrelated to Chesley et al. and unrelated to the claimed invention. Tamura et al. is directed to a process for forming optical recording media which has no relation to cling fasteners of Chesley et al. and the claimed invention.

As noted in the Action, Tamura et al. applies a liquid resin to a resin sheet and then cures the resin to bond the curable resin to the separate resin sheet. Contrary to the suggestion in the Action, Tamura et al. does not disclose prepolymers or radiation-cross linkable prepolymers. Furthermore, the curing process and the resulting product are unrelated to the claimed invention and unrelated to the method and product of Chesley et al. As noted in column 10, lines 67 and 68 of Tamura et al., the resulting product is a recording layer having a thickness in the range of 500 to 5000Å. The textured surface of the recording layer of Tamura et al. provides tracking grooves for optical discs and optical cards. The grooves have a width of 1 to 4 µm, a pitch of 1 to 20 µm, and a depth of 200 to 500Å. See, for example, column 8, lines 35-43 of Tamura et al. The depth of the pattern of 200 to 500Å corresponds to the wavelength of X-rays for 200Å and the wavelength of visible light. Thus, the resulting product has a substantially smooth surface

with nanometer size grooves. The process and materials used for producing the nanometer scale layer is completely different from the process and materials used to form interlocking cling fasteners.

The recording material in Tamura et al. is a liquid material that adheres to the surface of the drum and penetrates the nanometer size grooves in the drum. The liquid coating does not form a backing layer as in the claimed invention. The depth of the patterns formed in the drum enable the liquid resin material to flow into the pattern and form the nanometer size pattern. One skilled in the art would not consider the disclosure of Tamura et al. in making parts having a size several orders of magnitude greater than a recording media.

The three-dimensional structure of the claimed cling fasteners, and the interlocking projections formed by the cavities of the mold surface have no relation to the recording media of Tamura et al. Since the interlocking fasteners of the claimed invention cannot be produced by the process of Tamura et al., Tamura et al. is not properly combinable with the primary reference. Interlocking fasteners of the claimed invention require deep cavities for forming the stems and tips of the fasteners. The process requirements for completely filling the cavities of the mold surface to form interlocking cling fasteners is completely different from the process of Tamura et al. for forming nanometer size grooves in an optical media.

The Action suggests that Tamura et al. and Chesley et al. are directed to the same problem of preventing the material from running out of the cavities. However, Tamura et al. is not concerned with such a problem since Tamura et al. is directed to a process for forming a very thin recording layer on a resin layer where the recording layer has nanometer size grooves.

Tamura et al. is directed to curing an extremely thin layer of a photocurable resin after it has been removed from the drum and applied to the resin substrate layer. In contrast, the invention requires radiation curing to cure the base layer and the stem of the fastener from the base to the tip of the fastener before removing from the mold cavity. For sufficient curing, the radiation enters the base of the stem and travels through the long thin tubular cutouts forming the mold cavity. The intensity of the radiation has to be sufficient at the end of the mold cavity so that the tips of the fasteners are sufficiently cured. When using UV-curable resins to form the cling fasteners, UV light is scattered and absorbed by the material so that the intensity of the UV light is drastically reduced as the light travels down the length of the stem. Thus, the intensity of the UV light at the tip of the stem may not be sufficient to cure the resin due to the dimensions and length of the stems required for forming cling fasteners. Thus, it is not obvious to use the photocurable composition of Tamura et al. in the process of Chesley et al. for forming cling fasteners.

In view of the foregoing, it is not obvious to one of ordinary skill in the art to form cling fasteners by shaping a formulation of radiation-cross linkable prepolymers into the interlocking members of an integral formed base and curing the formulation by applying radiation as in claim 10. Accordingly, claim 10 is not obvious over the combination of Chesley et al. and Tamura et al. Claims 11-28 are also not obvious over the combination of Chesley et al. and Tamura et al. either alone or in combination with the feature of claim 10. For example, Chesley et al. and Tamura et al. do not disclose shaping the fasteners by casting and/or compression molding as in claim 11, the acrylic prepolymers of claim 12, the prepolymers of claims 13 and 14, the reactive diluents of claims 15-17 and 19, and the monofunctional acrylates of claim 18, in combination

with the process steps of claim 10. Chesley et al. and Tamura et al. also fail to disclose the electron beam radiation curing of claim 20, the UV-radiation of claim 21, or the photoinitiators of claims 22, 23 and 24, in combination with the features of claim 10.

The cited art also fails to disclose molding, casting or compression molding by applying the radiation-cross linkable prepolymer formulation to a gap between a shaping roll and a backing roll where the shaping roll has a large number of cutouts forming the interlocking members as in claim 25 in combination with the process steps of claims 10 and 11. As discussed above, the viscosity of the prepolymer formulation is sufficient to be applied to a backing layer by a doctor blade which is then compression molded onto the molding drum. As shown in Tamura et al., the oligomer resin composition is a liquid that is applied as a thin layer on the drum by rotating the drum through the liquid resin. Tamura et al. and Chesley et al. fail to disclose the viscosity of claims 26 and 27. Furthermore, since the process of Chesley et al. and Tamura et al. are different from the claimed process, it is not obvious to one of ordinary skill in the art to provide a radiation-cross linkable prepolymer formulation having the claimed viscosity of claims 26 and 27 either alone or in combination with the process steps of claim 10.

Claim 28 depends from claim 10 and is similar to claim 25 by reciting the shaping of the formulation by applying the formulation to a gap between a shaping roll and a backing roll and shaping the fastener by compressing the formulation into the cutouts in the shaping roll. Thus, claim 28 is allowable for the same reasons as claim 25.

In view of the above comments, claims 10-28 are not obvious over the combination of the cited art. Accordingly, reconsideration and allowance are requested.

Respectfully submitted,



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